

# NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

November 8, 2011

# Precipitation and Snowpack

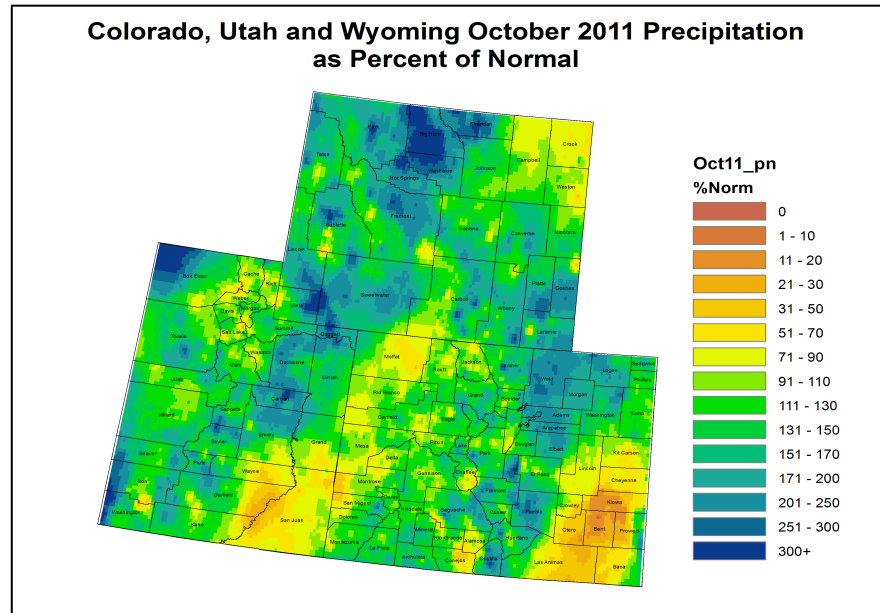


Fig. 1: October precipitation as a percent of average.

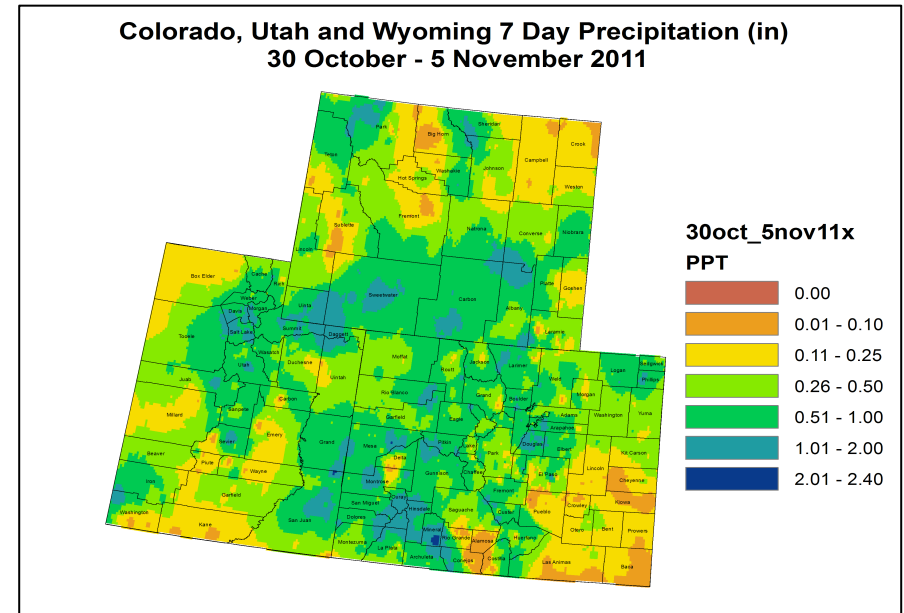


Fig. 2: October 30 – November 5 precipitation in inches.

In October, most of the Upper Colorado River Basin (UCRB) received near to above average precipitation (Fig. 1). The Colorado River valley in southeast Utah was drier, receiving only around 50% of the average October precipitation in some spots. The Upper and Lower Green River basins in the northern part of the UCRB saw over 150% of their average precipitation. The Colorado River headwaters region and the San Juan mountains to the south also received generous moisture for the month, receiving more than 110% of average.

Last week, precipitation was widespread across much of the UCRB and in northeast CO (Fig. 2). The San Juan mountains saw between half an inch to 2 inches in liquid accumulation last week. Amounts across the entire UCRB (including the Colorado River valley, which has been recently drier) ranged from a quarter inch to 2 inches. Northeast CO also saw amounts greater than a quarter inch. Though southeast CO and the San Luis Valley did not benefit from last week's storms, they have received beneficial moisture in the past 24 hours, with amounts ranging between .25 and .75 inches of precipitation (not shown).

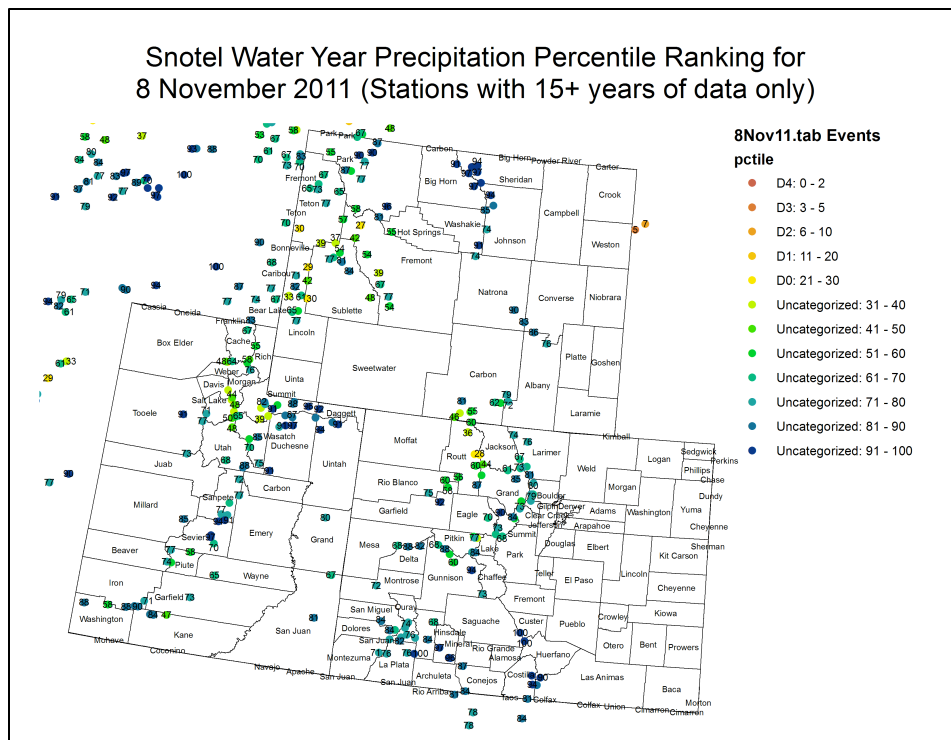


Fig. 3: SNOTEL WYTD precipitation percentiles (50% is median, 21 – 30% is Drought Monitor’s D0 category).

Water-year-to-date (WYTD), SNOTEL precipitation percentiles are in the near to above average range throughout most of the UCRB (Fig. 3) and are indicating a good start to the winter snowfall season. SNOTEL sites in the Upper Green River basin and in the northern and central mountains of CO range from around the 50<sup>th</sup> to the 80<sup>th</sup> percentiles. The southern mountains of CO and the mountains in northeast UT have already seen excellent precipitation accumulations since the beginning of the water year and are currently near or above the 90<sup>th</sup> percentile at many sites.

Around the Colorado River Headwaters, snow water equivalent has been tracking near average since the beginning of the water year (Fig. 4). Several early snow events quickly melted away, but since the end of October, snowpack has been steadily accumulating in the basin and cooler temperatures have prevented melting.

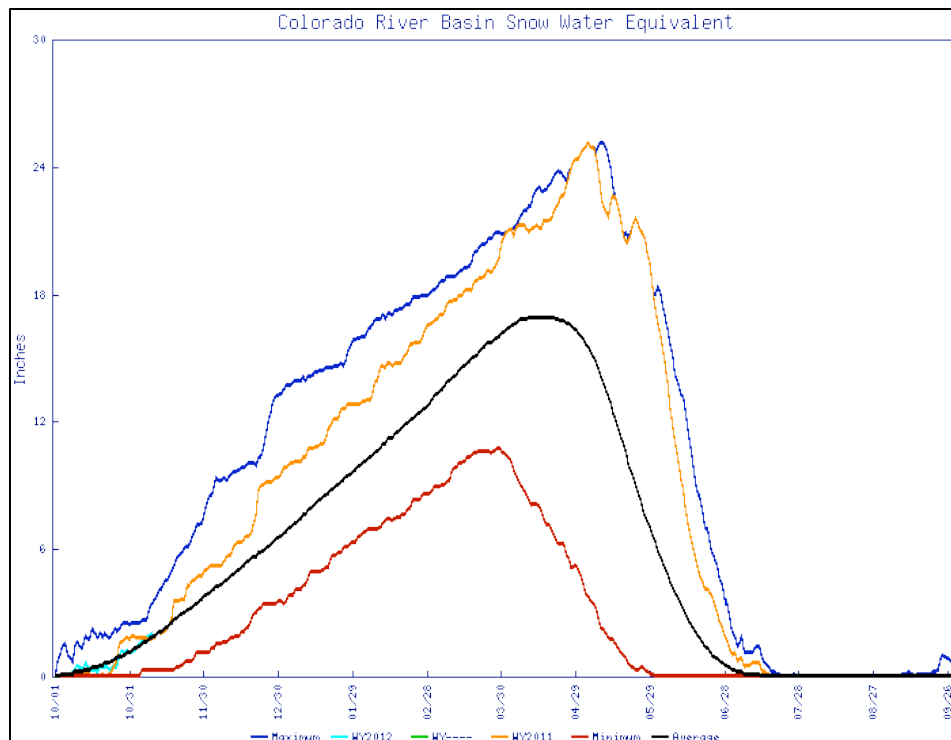
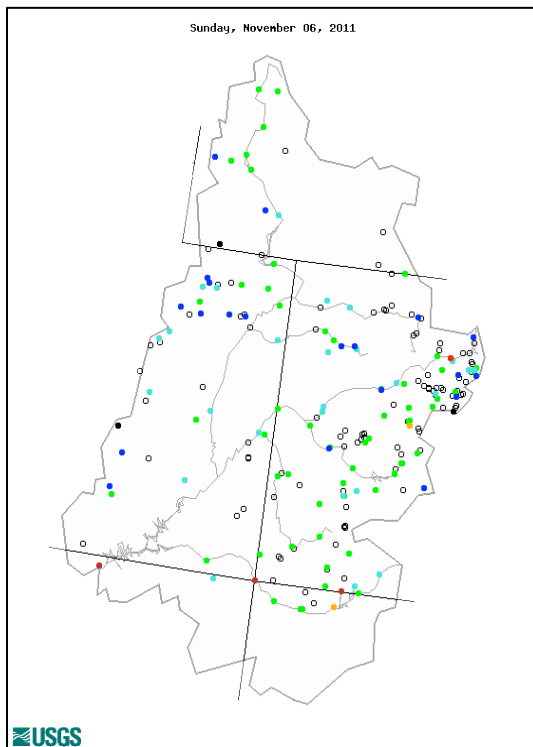


Fig. 4: CO Headwaters WYTD snow water equivalent accumulation (teal line) compared to average (black) and last year (orange).

# Streamflow

As of November 6<sup>th</sup>, 94% of the USGS streamgages in the UCRB recorded normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal 7-day average streamflows (Fig. 5). About 21% of the gages in the basin are recording much above normal flows, while 4% of the gages in the basin are recording much below normal flows. Most of the gages recording below normal flows are located in the southern part of the basin (in the San Juan basin). Higher flows are currently being observed near the Colorado River headwaters in CO and along the Duchesne River in UT.

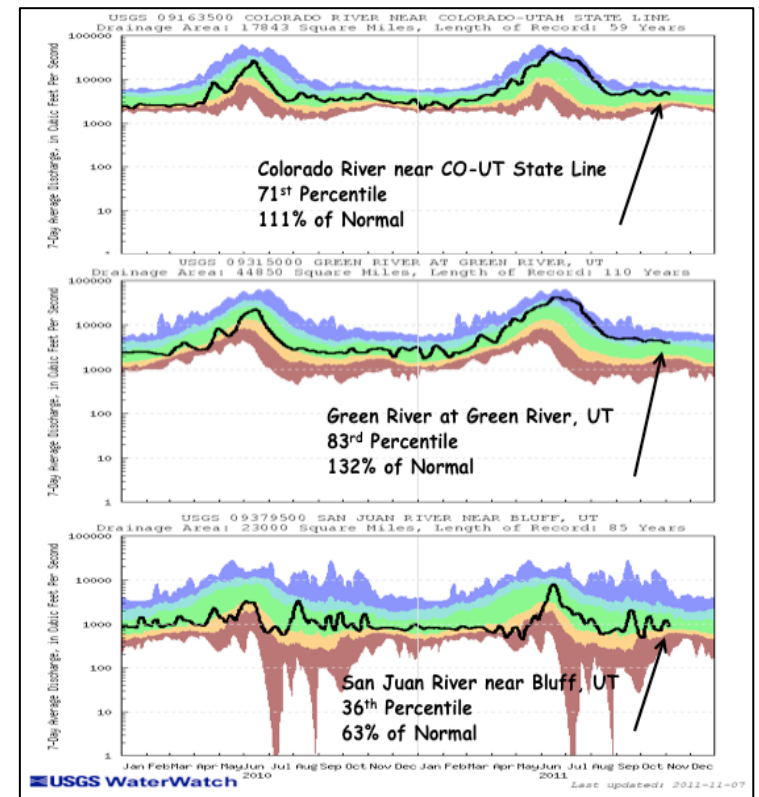
Key gages on the Colorado River near the CO-UT state line and the San Juan River near Bluff, UT are currently recording near normal flows at the 71<sup>st</sup> and 36<sup>th</sup> percentiles, respectively (Fig. 6). The Green River gage at Green River, UT is reporting above normal flows at the 83<sup>rd</sup> percentile.



Explanation - Percentile classes							
<span style="color: red;">●</span>	<span style="color: red;">●</span>	<span style="color: orange;">●</span>	<span style="color: green;">●</span>	<span style="color: cyan;">●</span>	<span style="color: blue;">●</span>	<span style="color: black;">●</span>	<span style="color: gray;">●</span>
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: 7-day average discharge compared to historical discharge for November 6<sup>th</sup>.

Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



# Water Supply and Demand

Cooler than average temperatures have continued to dominate the UCRB and eastern CO. The cooler temperatures have helped early snowpack conditions build up without subsequent melting. The VIC model is showing improving soil moisture conditions where long term dryness has prevailed for much of the year over southeast CO (Fig. 7). Dry soil conditions are showing up in UT around the Colorado River valley. Dry soils are also still showing up in Sweetwater County, WY, but some improvements can be seen. The rest of the UCRB shows near average soil moisture with the Wasatch range in UT and the mountains near the Colorado Headwaters showing wet soils.

All of the major reservoirs above Lake Powell in the UCRB ended the month near or above their average October volumes. Flaming Gorge and Lake Granby are well above their averages, at 111% and 112% respectively. Lake Powell ended the month at 89% of average and 71% of capacity, compared to 63% of capacity last year.

## Precipitation Forecast

The compact, fast moving disturbance that brought snow to the extreme southern portion of the UCRB will exit the area today, while the rest of the basin remains under the influence of a high pressure ridge. This ridge will expand over the entire basin today and bring mostly dry conditions to the region for several days. The ridge will persist over the UCRB through Saturday as the next upper level trough begins to approach from the northwest. This feature will begin to spread snow showers into northwestern parts of the area Saturday evening, with liquid accumulations generally remaining below 0.25 inches through the weekend. The forecast beyond the weekend remains quite uncertain as forecast models struggle to resolve the strength and timing of incoming Pacific storm systems. Expect the majority of the UCRB to experience more unsettled conditions moving into early next week, with the potential for accumulating snowfall over mountain locations by Tuesday.

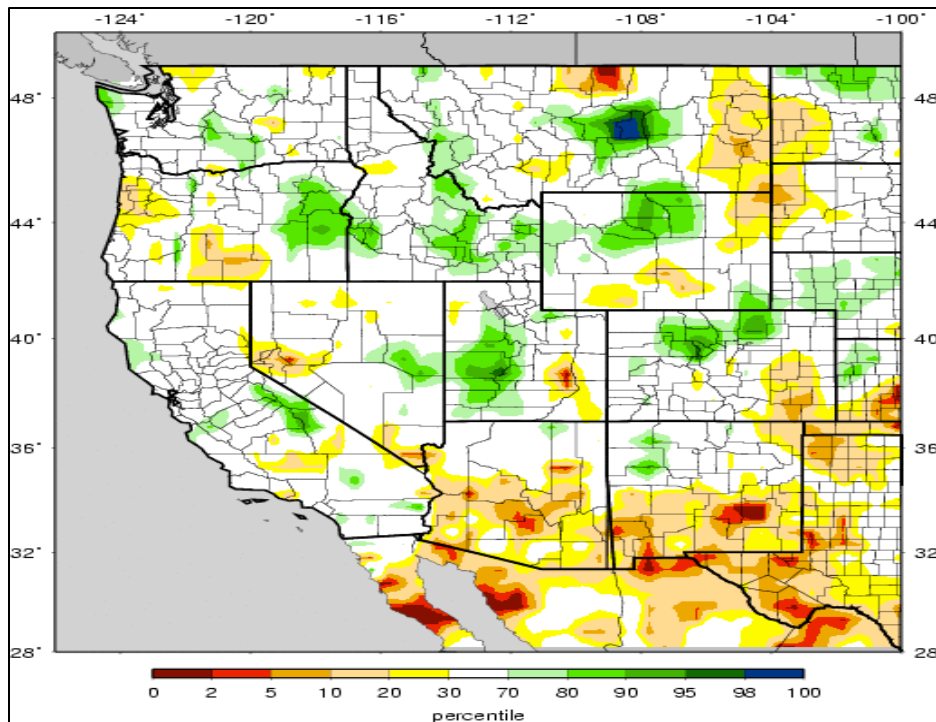


Fig. 7: VIC soil moisture percentiles as of November 6<sup>th</sup>.

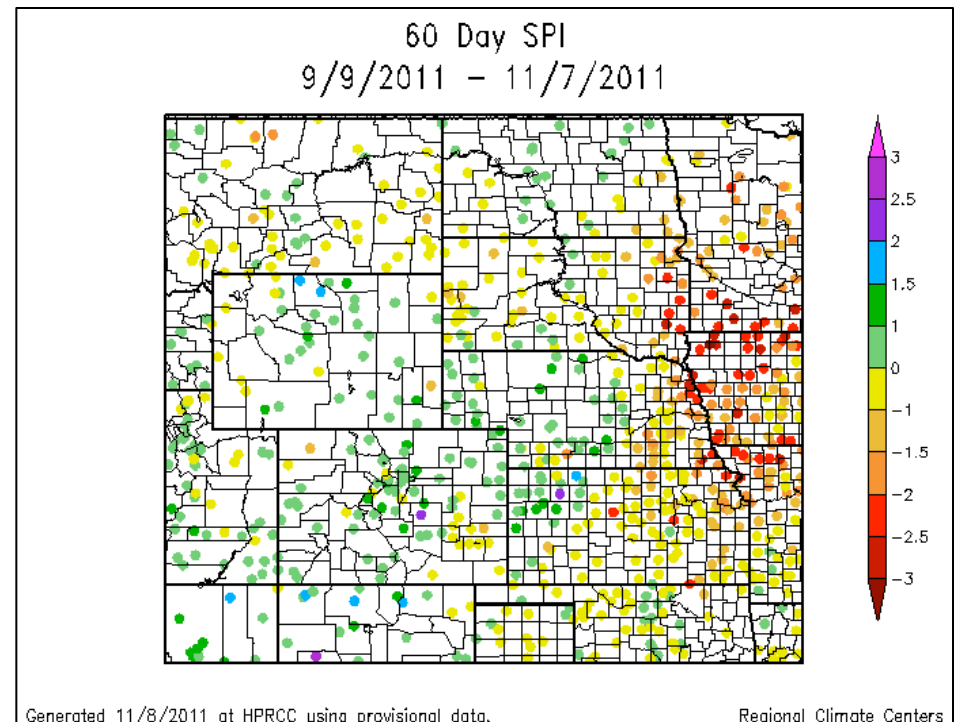


Fig. 8: 60-day standardized precipitation index (SPI) as of November 7<sup>th</sup>.



# Drought and Water Discussion

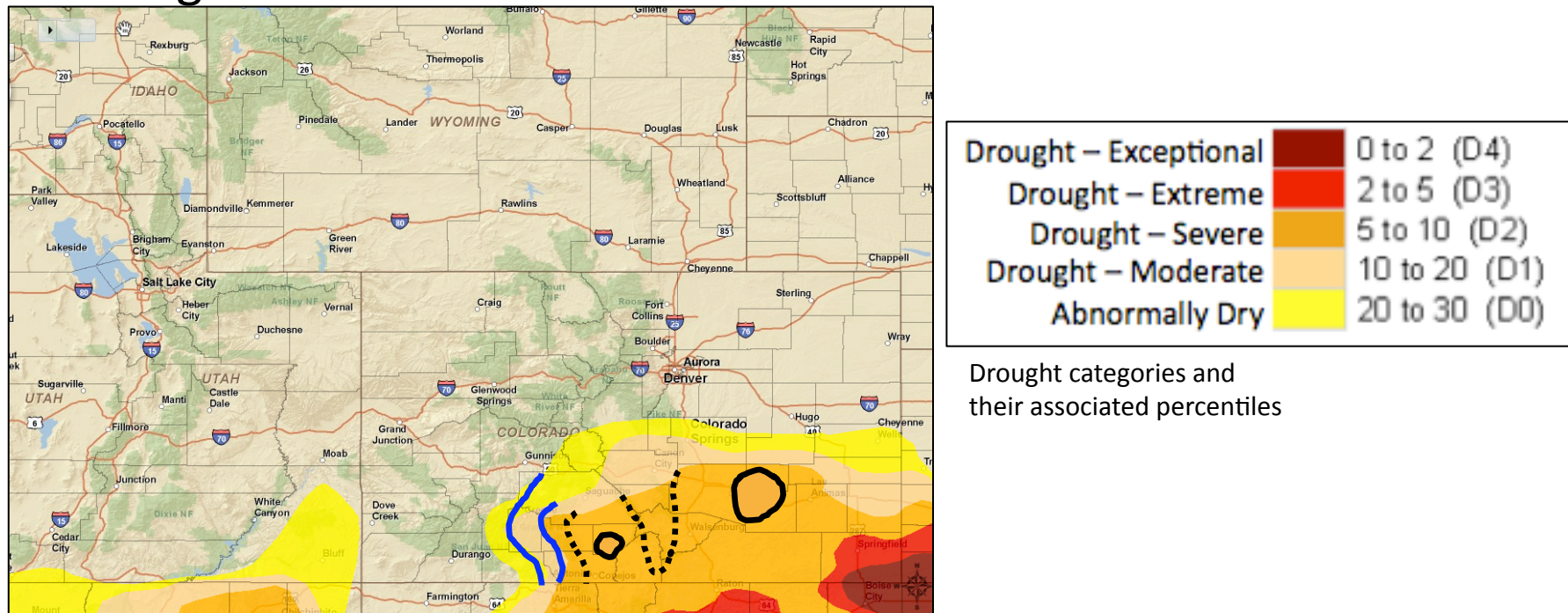


Fig. 9: November 1<sup>st</sup> release of U.S. Drought Monitor for the UCRB

Drought categories and their associated percentiles

Status quo is recommended for the UCRB in the most current depiction of the U.S. Drought Monitor (USDM) map (Fig. 9). Continued dryness in southeast UT still warrants the D0 there. This area should be closely monitored for a westward expansion of the D0 (to cover the Colorado River valley) in the near future, however that is not necessary for this week as some beneficial precipitation did accumulate in the region.

Widespread precipitation throughout southeast CO and the San Luis Valley will mean that some improvements can be made. Short-term SPIs show the recent ample precipitation that has fallen throughout the area (Fig. 8) with SPIs between 0 and -1 around Kiowa, Otero, Crowley, and Bent counties and positive in the other drought stricken areas. Long-term SPIs are also showing improvements. D3 can now be eliminated from the San Luis Valley and the Otero/Crowley County region (Fig. 9, solid black). D2 can also be trimmed back along the San Juan and Sangre de Cristo mountains (Fig. 9, dashed black). In the San Juan mountains, where WYTD precipitation is already well above average, D1 and D0 can also be trimmed (Fig. 9, blue lines).